

ON THE
Disadvantages

Which attend the

INOCULATION

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C H I L D R E N

I N

EARLY INFANCY.

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ON THE

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INOCULATION

OF

CHILDREN

IN

EARLY INFANCY.

BY

THOMAS PERCIVAL, M. D. F. R. S.



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THE
FOLLOWING ESSAY
IS,
WITH GREAT RESPECT,
INSCRIBED TO
GEORGE LLOYD, ESQ. F.R.S.
BY
HIS MUCH OBLIGED,
AND
MOST OBEDIENT SERVANT,
THE AUTHOR.



ARGUMENTS

AGAINST THE

Inoculation of Children in early
Infancy.

THE advantages arising from inoculation are now so universally acknowledged, that arguments in support of it are entirely unnecessary. The rapid progress it hath made, affords the strongest presumption in favour of its safety and utility; and the well-attested accounts which we every day read, of the amazing success with which it is practised, justly remove every prejudice against it, whether political or religious. The patrons of inoculation therefore,

have nothing to fear from its avowed enemies, if any such there be ; but they have the utmost reason to guard against the mistaken zeal of its friends, which is more dangerous to its real interest, than opposition itself. Credulity, fashion, the love of novelty, and a propensity to rush from one extreme to another, are principles which govern the generality of mankind. And how unfavourable these have been to the advancement and perpetuity of improvements, might be demonstrated by numerous examples. That the artificial method of communicating the small-pox, so happily introduced amongst us, may not hereafter be added to this disgraceful list, every sincere advocate for it, should exert his warmest endeavours to discourage the wanton levity, with which it is at present in many places adopted. For it requires not the spirit of prophecy to foretel, that the indiscriminate use of remedies, excess in the cooling regimen, and a total disregard to age, temperament, and habit of body, will in the issue subvert the reputation, and check the progress of one of the most important discoveries in the whole circle of physic.

IN

IN a late excellent work, published by a respectable Society of Physicians in London, Dr. MATY hath inserted an essay on the advantages of very early inoculation. He proposes that people should be induced by persuasion, and by other encouragements if necessary, to inoculate their children as soon as possible after their birth. And this appears to him to be the *maximum*, to which the art of ingraftment can be brought, both with respect to individuals, and to the public. But the Doctor's reasoning in support of his hypothesis, is more ingenious and plausible, than solid and satisfactory. And I apprehend the practice he recommends, would considerably diminish the benefits arising from inoculation, and would be of dangerous and fatal consequence to mankind. I shall endeavour therefore to point out the disadvantages which would attend the ingraftment of new-born children; and shall afterwards make some strictures on Dr. MATY's arguments in favour of it.

I. THE

1. THE number of diseases to which infants are incident, render them unfit subjects for inoculation. HIPPOCRATES, two thousand years ago remarked, *Ætatibus morbosissimi sunt juniores*. And when we consider the great and sudden changes, both external and internal, which they undergo at birth; the laxity and wonderful delicacy of their frame, and their extreme irritability perhaps depending upon it; the copiousness of the glandular secretions, with the difficulty of preserving that equilibrium, the least deviation from which affects them; it is matter of real astonishment, that life itself can be supported, under a series of such apparently unfavourable circumstances. Scarce hath the little stranger been ushered into the world, but he discovers signs of indisposition, by his restlessness, anxiety, crying, and vomiting, by the swelling of his belly, and sometimes by convulsions. These symptoms arise from the load of meconium with which the stomach and bowels are oppressed, and generally cease when those organs have been gently evacuated.

ed. The jaundice next succeeds, and is sometimes complicated with a very acrimonious state of the fluids, as appears by the eruption of little red pustules, with which the skin is every where loaded. The thrush, watery gripes, and convulsions observe no regular order of time, but attack most infants, either singly or collectively, according as they are more or less obnoxious to the causes which produce them. The quick growth of children in the first period after birth, is likewise a source of numerous ailments; notwithstanding the provision which nature hath made, to guard against the inconveniences resulting from it, by the laxity of the glandular system. The sudden ampliation of the fœtus, in the matrix of the mother is truly surprising. Dr. HARVEY relates, that in the deer kind, he observed the *puctum saliens*, on the 19th or 20th of November. On the 21st he saw the vermiculus or embryo of the animal; and on the 27th the fœtus was so perfect, that the male might be distinguished from the female, the feet were formed, and the hoofs were cloven. This rapid growth must be ascribed to the soft and yielding structure of the fœtus, to
the

the plenty of nutrition it receives, to its exemption from all discharges, and to the proportionably strong action of its little heart. And as most of these causes continue to exert their influence after birth, though in a less degree, the increment of the young animal proceeds apace, and redundancies are formed, which in a healthy state are carried off by one or other of the glandular excretions. But a deficiency or excess in any of these, necessarily produce diseases. And in such feeble, delicate and irritable subjects, the equilibrium cannot long be preserved. If they are defective, all the complaints which arise from plenitude ensue; the child grows feverish, dull and comatose, his stomach is disordered, his bowels are oppressed with wind, and if his belly be constipated he falls into convulsions. On the other hand, if they are excessive, a diarrhoea is produced, aphthæ and severe gripes succeed, and the violent irritation seldom fails to occasion epileptic fits. From this short view of the first period of infancy, I think it must appear evident, that inoculation is ill adapted to that tender season of life. Nature, weak and feeble as she then is, can scarcely

scarcely struggle with the diseases to which she is ordinarily exposed: it is therefore equally cruel and unjust to add to the number with which she is already oppressed. For it is demonstrable from the bills of mortality, that two thirds of all who are born, live not to be two years old; and I think it is more than probable, that a considerable proportion of these, die under the age of six weeks.

2. THE fears and anxiety of the mother, excited at a time when her strength hath been exhausted by the pains of labour, and when every uneasy impression should be cautiously avoided, cannot fail to injure her milk. And this is a powerful objection to the early ingraftment of infants. If a hired nurse be employed, her milk may disagree with the child, she may fall into some disease during the time of inoculation, may be guilty of excess in eating or drinking, or may be under the influence of violent passions; each of which will aggravate the symptoms, and increase the danger of the artificial distemper, under which the infant labours.

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3. IT

3. It hath been observed by a very able and experienced practitioner*, that young children have usually a larger share of pustules from inoculation, than those who are a little farther advanced in life: and that from this circumstance so many have died as to discourage the practice of ingrafting the small pox on such delicate subjects. This fact is not easy to be explained. Whether the greater irritability of infants, subjects them to be more affected with the ingrafted miasma, than children of three or four years old; or whether the larger eruption, to which they are liable, be owing to the proportionably greater quantity of their fluids, I will not presume to determine. Both causes may possibly conspire to produce this effect: the former by exciting a quicker and increased contraction of the heart and vascular system; the latter by affording a more copious pabulum for the variolous ferment.

4. A considerable number of those who die of the natural disease, before the expulsion of
of

* Dr. DIMSDALE.

of the variolous eruption, are infants or very young children †. This does not arise, as Dr. KIRKPATRICK supposes, from the extreme weakness of the *vis vitæ* of infants ; for the contraction of their hearts is proportionably stronger than in adults, as the quickness of their growth evinces ; but from the high degree of irritability with which their nervous system is endued. Hence the convulsive paroxysms, which often precede the appearance of the pustules, and which, though regarded by SYDENHAM as no unfavourable signs, are always alarming, and when they happen to very young infants, are frequently fatal.

5. If such a number of pustules should break out in the mouth or throat as to obstruct suction, the disease in all probability would prove fatal. Even a few pocks in those parts are highly troublesome and dangerous to infants ; for besides the pain and restlessness, which they produce, they often terminate in ill conditioned ulcers ‡.

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6. THOSE

† KIRKPATRICK's Analysis. ‡ Vid. SCHULTS on Inoculation.

6. THOSE who are affected with cutaneous diseases, have been generally regarded as unfavourable subjects of inoculation §. Infancy, therefore, which is seldom unattended with eruptions on the skin, must be an improper period for receiving the small pox by ingraftment.

7. THE thickness of the teguments of infants, which arises from the quantity of fluids interposed between their fibres, by which the skin is rendered soft and œdematous to the touch, and their perspiring less than children who are capable of using exercise, are further objections to very early inoculation.

8. But the most forcible argument against this practice, is deduced from the ill-success which hath attended infant inoculation in general. For it appears by Dr. JURIN'S account of the progress of inoculation in Great-Britain from 1721 to 1726, and by Dr. SCHEUCHZER'S continuation of it to 1728, that

§ Dr. JURIN'S Account of Inoculation.

that out of twenty-four children under one year old, who received the small pox by ingraftment, two died ; and four out of thirty-four, betwixt one and two years of age.

HAVING thus pointed out some of the principal objections to the early inoculation of infants, I shall make a few remarks on Dr. MATY's ingenious essay in favour of it. After enumerating the advantages which infancy has with regard to the small pox, the Doctor sums up the whole by saying :
 “ If there is a period in which the machine
 “ is in a perfect state, it certainly is imme-
 “ diately before it begins to be spoiled, or at
 “ the first period after nativity †.” This assertion, I apprehend, is repugnant to reason, anatomy, and experience. It seems to be a general law of nature, that all organised bodies should advance by progressive stages to their acme or state of perfection ; and should then decline by the same regular gradation. A plant when it first springs out of the ground is frail and tender, by degrees the stem thickens, the leaves expand themselves, the juices are concocted, the flower
 opens,

† Medical Observations, Vol. III. p. 290.

opens, the seed is formed, ripened, and shed; and when the office assigned it by the sovereign Creator is thus accomplished, it droops, withers, and falls into decay. The animal world furnishes still more striking proofs of the truth of this observation. And I know nothing which contributes more to the beauty and harmony of the universe, or affords a more admirable display of the wisdom of its great Author, than the order and uniformity with which these successive changes are carried on, amongst the different classes of beings.

FROM the researches of anatomists into the structure of the human body, it is evident that our machine in infancy is comparatively extremely imperfect, that its parts are disproportioned, and its organs incapable of those functions, which they are destined in future life to perform. The head of a new-born child, bears a much larger proportion to the bulk of his body, than that of an adult; the former being as one to three; the latter only as one to eight. And this joined to the remarkable laxity of the fibres in infancy, is the reason

reason perhaps of the excessive irritability with which the body is then endued, and which lays a foundation for numerous diseases. The Liver and Pancreas are so immensely distended, as to fill up almost the whole cavity of the abdomen; and the copiousness of their secretions is equal to their bulk. The bile, cystic and hepatic, is almost insipid, and so inert that it is incapable either of promoting digestion, or of neutralizing those acidities, which the weakness of the stomachs, and the acescency of the food of infants, generate in the *primæ viæ*. Hence probably arise the crudities, flatulency, gripes, aphthæ, and convulsions, to which children, at that tender age, are peculiarly exposed. The heart, with respect to the vascular system, is both stronger and more bulky in infancy than in after life*. By this means the blood is propelled with greater force; and as the arteries,

* By the curious tables of Dr. BRYAN ROBINSON, it appears, that the weight of the heart with respect to the weight of the body, is greater in a child than in a man, in the proportion of three to two: that the quantity of blood which flows through the heart in a given time is greater in children than in grown bodies, in the proportion of twenty to seven, which is the proportion of their pulses in a minute: and that the velocity of the blood is greater in a child than a man, in the proportion of eighty to seven.

teries at that period have less firmness and density than the veins, as appears by Dr. WINTRINGHAM'S experiments, they are then most yielding and distensible. And both these causes equally conspire to promote and quicken the growth of the young animal. But wise and necessary as this provision of nature is, it unavoidably exposes the infant to all the dangers which arise from a plethora; and must be considered as a present imperfection, however well adapted it may be to those progressive changes, which advance him from childhood to maturity. For by degrees the heart abates of its proportional force, and the arteries acquire their greatest amplitude. At this period the moving powers of the machine are equally ballanced, and the body seems to enjoy for a while a state of rest. But the delicate equilibrium cannot long be maintained: The heart grows feeble and languid, the arteries gradually contract themselves, a venous plenitude ensues, and old age closes the scene.

BUT analogy may deceive us, the observations of anatomists may be doubtful; experience

debilitated, and their faculties so impaired, that the effects have been perceptible during the remaining part of their lives ||."

" That disposition in the intestinal tube to
 " excoriate, which arises from the too great
 " acrescency of milk or vegetable aliments,
 " easily corrected by Magnesia, Lime-Water,
 " Oil, and by small quantities of broth
 " or other animal food†." The remedies
 which Dr. MATY hath here pointed out,
 are very judicious and proper; but their
 effects are much more uncertain than he seems
 to apprehend. The ailments of children are
 generally very complicated, and the indica-
 tions of cure are often obscure and doubtful.
 In their irritable bodies, one symptom fre-
 quently brings on a variety of others, some-
 times connected with the original one, at other
 times, to all appearance totally dissimilar.
 And these symptoms of symptoms, as they
 are termed, do not always cease, when the
 cause which first produced them is removed.
 This every physician experiences, who is con-
 versant with the diseases of infants; and it
 necessarily

|| Dr. DIMSDALE on inoculation.

† Medical Observations, Vol. III. p. 293.

necessarily occasions, in his treatment of them, a good deal of difficulty and confusion.

“ The multitude of disorders, which children are liable to, ought certainly to induce us to attempt lessening the number of them, at least by one†.” This argument which Dr. MATY hath adduced in favour of Infant-Inoculation, I consider as one of the most powerful objections against it. But as I have before enlarged upon it, I shall in this place only observe, that the small-pox is a distemper to which children in the first period of life, are very little exposed; because at that tender age, they are neither in the way of infection, nor are they much disposed to receive it.

FROM the lists of Dr. JURIN, and Dr. SCHEUCHZER, Dr. MATY, finds that nine out of two hundred and seventy-three, i. e. one out of thirty, inoculated under five years of age, died between the years 1721, and 1728. But if the doctor had confined himself, as he ought to have done, to the list of those who died by inoculation under one year old, he

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would

† Medical Observations, Vol. III. p. 293.

would have found the proportion to be vastly greater, viz. no less than one in twelve. But as even one in thirty is a great mortality, and as the operation in grown people, during that period, appears to have carried off only one in fifty; Dr. M. endeavours to obviate this objection in the following manner:

“ As so many more children under five years,
 “ die of different disorders, than at any other
 “ age, it is more than probable that several,
 “ perhaps most of these nine would have
 “ died, though they had not been inoculat-
 “ ed||.” But I would ask the doctor, where is the justice or propriety of ingrafting the small-pox, at a period, when the risque is so great of other dangerous and fatal distempers acceding to it? For slightly as this artificial disease is now regarded, it is of itself sufficient for the feeble powers of nature, in early infancy to struggle with.

THE second part of Dr. MATY's essay, displays the political advantages, which would accrue from the early inoculation of infants. But if it be evident from what has been advanced, that the practice he recommends, is
 prejudicial

prejudicial to individuals, it will require no arguments to prove that it must be equally so to the public. I cannot however forbear to express my admiration of the benevolent, though chimerical expectation of the doctor, that by ingrafting the small-pox on every new-born child, this loathsome and destructive distemper, would in less than half a century be utterly extirpated. “Happy would it be, says he, if this desirable revolution could be brought about in our days, and if posterity, remembering only the name of this fatal scourge, should have it in their power to say, The small-pox, which like the leprosy of the ancients, is now only known by their descriptions, was in the twelfth century, spread all over Europe by ignorant and enthusiastical bands, and by a wiser generation, extirpated in the eighteenth§.”

To conclude: Though infants are less proper subjects for receiving the small-pox by ingraftment, than children a little further advanced in life, yet it must be confessed, that such circumstances may occur, as to render the

§ Medical Observations, Vol. III. p. 306.

the inoculation of them highly expedient and adviseable. In such cases however, I think the age of two or three months, is preferable to the period Dr. MARTY recommends. For it will then be too early to apprehend any disturbance from dentition; and yet the child will have surmounted some of the diseases, peculiar to the first stage of its existence. The chylopoietic organs will also by that time have been so strengthened by exercise and habit, as to discharge their functions with some degree of regularity. But the fittest season for inoculation seems to be, between the age of three and seven, in healthy children, and of four and seven in those who are tender and delicate. The powers of nature are then sufficiently vigorous; perspiration is free and copious; the irritability of the body is greatly diminished; the viscera are sound and unobstructed; the mind though active and lively, is not disturbed by violent emotions; the teguments are properly extenuated; and the fibres are neither too tense, nor too lax for the variolous eruption. To these important advantages may be added, that at this age the child is both a proper subject for preparatory medicines, and for
such

such as may be deemed necessary during the course of the distemper. It is no wonder therefore, that the practice of inoculation is attended at this period with most success. And it is seriously to be lamented, that the precious opportunity is not universally embraced.

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